

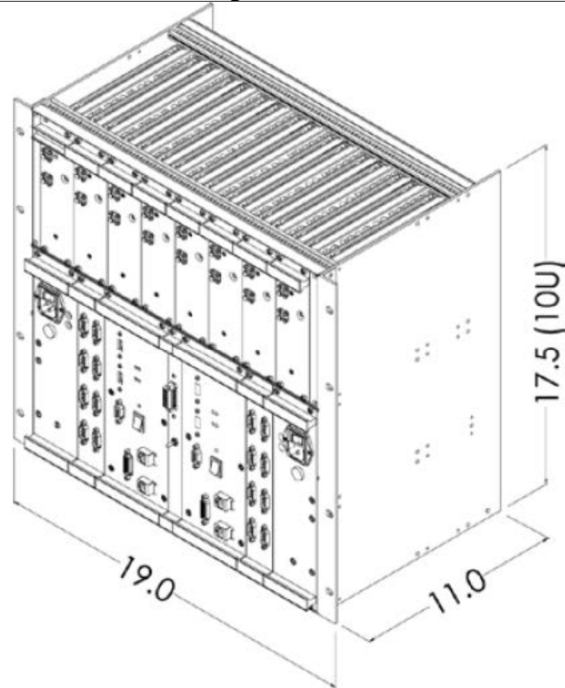
Exhibit M


**Exhibit M - Example Infringement Claim Chart Demonstrating Respondent Kapsch's Infringement
By Its JANUS Multiprotocol Reader II of the '656 Patent**

The chart below demonstrates how Respondent Kapsch's JANUS Multiprotocol Reader II ("MPR2"); or systems incorporating Kapsch Transponders and Kapsch MPR2 infringe at least claim 29 of U.S. Patent 9,262,656 (the "'656 Patent").

Amtech provides the following example claim charts based on the information currently available, including through public sources. Amtech reserves the right to modify, amend, or supplement these claim charts should it become aware of additional information regarding the accused products, including through discovery, or should one or more claims be construed in a manner differently than interpreted herein.

| U.S. Patent No. 9,262,656 | |
|---|---|
| Claim | Kapsch MPR2 |
| 29[pre] A multiprotocol RFID system comprising: | <p>To the extent the preamble is limiting, the MPR2 and transponders with which the MPR2 communicates comprise a multiprotocol RFID system.</p> <p>The JANUS® Multiprotocol Reader II (MPR2) takes accurate transponder identification and reliable revenue capture to the next level — and ensures your interoperable future. The reader is built on a highly scalable and redundant operating environment, and supports most major North American industry tolling protocols. JANUS MPR2 provides ease of installation, integration, maintenance, protocol selection, and facilitates a future transition strategy.</p> <p>JANUS Multiprotocol Reader II at 1.</p> <p>The Janus MPR2 Reader is illustrated below:</p> |




| U.S. Patent No. 9,262,656 | |
|---------------------------|---|
| Claim | Kapsch MPR2 |
| |  <p>JANUS Multiprotocol Reader II at 2.</p> |

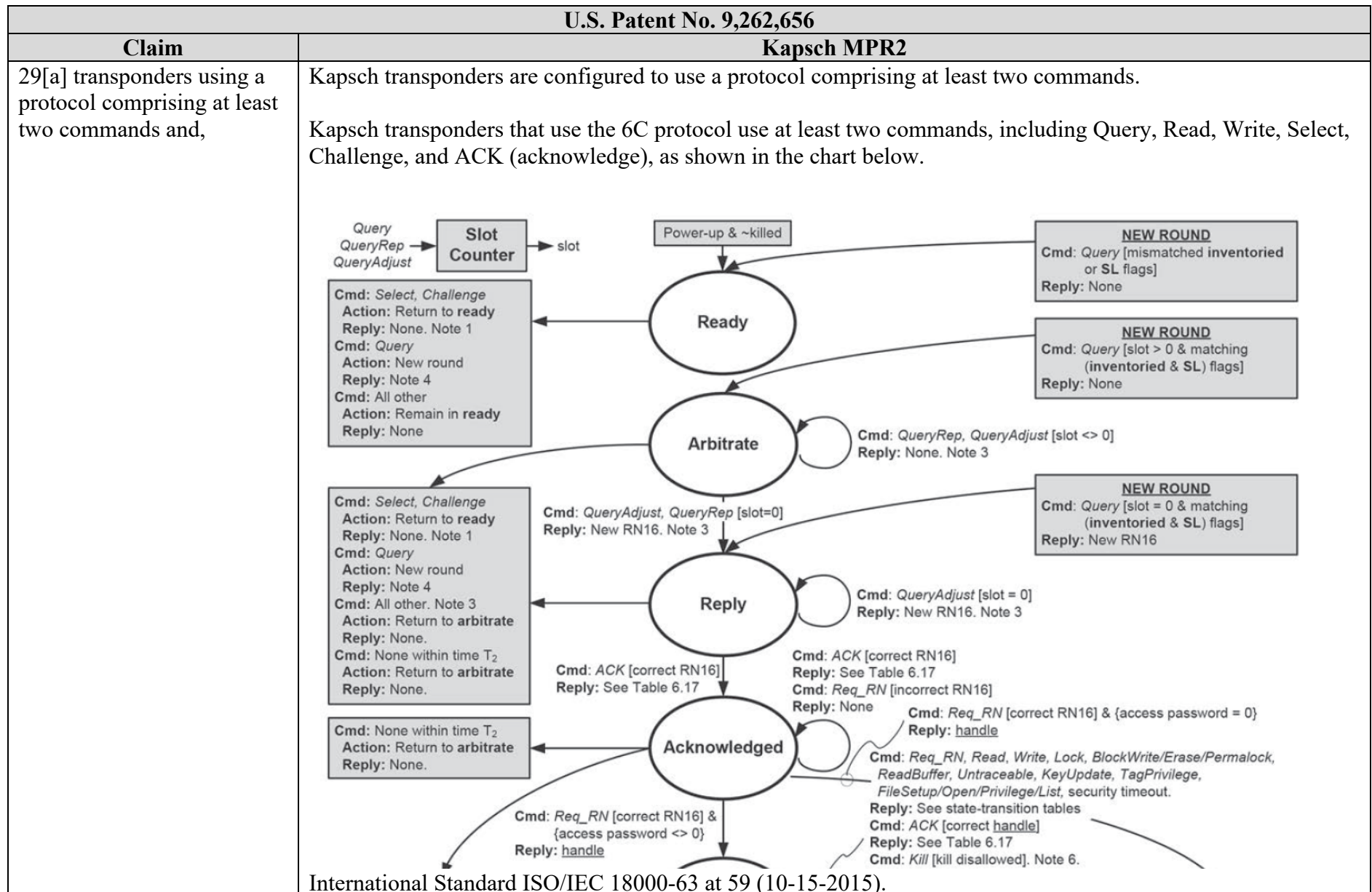
| U.S. Patent No. 9,262,656 | |
|---------------------------|---|
| Claim | Kapsch MPR2 |
| |  <p>JANUS Multiprotocol Reader II at 1.</p> <p>The MPR2 reads both active RFID transponders (<i>e.g.</i>, Interagency Group (IAG) or E-ZPass time division domain (TDM) tags) and backscatter RFID transponders (<i>e.g.</i>, ISO 18000-63 (6C) tags or Super eGo (SeGo) tags).</p> |

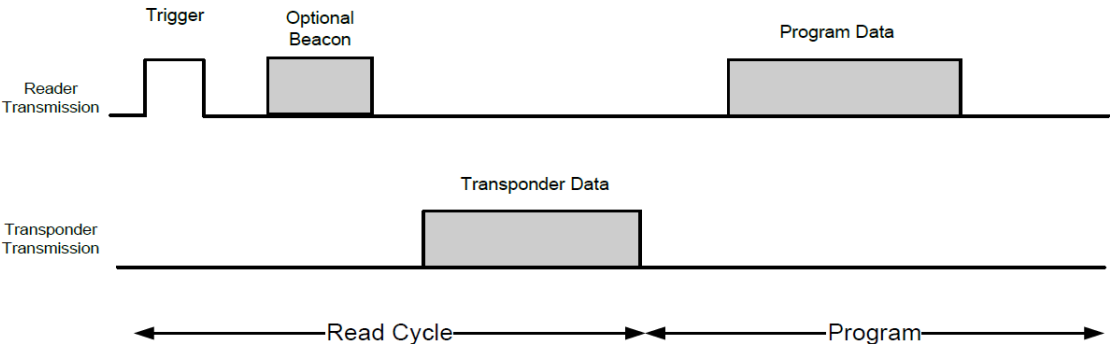
| U.S. Patent No. 9,262,656 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|--|--------------------------|-------|--|--|---------------------|--------------------|--|--|------------------------|---|--|--|--------|---|--|--|---------------------|-------------------------------------|--|--|----------------|---------------------|--|--|-----------------------|--|--|--|---------------------|------------------------------------|--|--|-------------------|-------------|--|--|-------------------|------------------------------|--|--|-------------------------|--|--|--|------------|--|--|--|----------------|-----------|------|-------|--|------------------------------|---|---|--|-------------------|---|--|--|-------------------|---|---|--|---------------|---|--|--|------|---|--|--|---------|---|--|--------------------------|--|--|--|----------------------|--|--|--|
| Claim | Kapsch MPR2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><th colspan="4">Technical Specifications</th></tr><tr><td>Operating Frequency</td><td colspan="3">■ 902 to 921.5 MHz</td></tr><tr><td>Dimensions (W x H x D)</td><td colspan="3">■ 19.0 in (48.3 cm) rack mount (10U height) ■ 19.0 x 17.5 x 11.0 in. / 48.3 x 44.5 x 27.9 cm</td></tr><tr><td>Weight</td><td colspan="3">■ 63 lbs. / 28.6 kg (cabinet options available)</td></tr><tr><td>Buffered Capacity *</td><td colspan="3">■ 400,000 to 1,000,000 transactions</td></tr><tr><td>Error Checking</td><td colspan="3">■ Protocol specific</td></tr><tr><td>Operating Temperature</td><td colspan="3">■ -34.6°F to +131°F / -37°C to +55°C ■ -34.6°F to +165°F / -37°C to +74°C (with circulating fans)</td></tr><tr><td>Storage Temperature</td><td colspan="3">■ -49°F to +199°F / -45°C to +93°C</td></tr><tr><td>Shock & Vibration</td><td colspan="3">■ NEMA TS-1</td></tr><tr><td>Relative Humidity</td><td colspan="3">■ 5 % to 95 % non-condensing</td></tr><tr><td>Input Power/Consumption</td><td colspan="3">■ 350W (redundant), 296W (non-redundant) @ 120 VAC</td></tr><tr><td>Regulatory</td><td colspan="3">■ Reader: FCC Part 15 Class A UL 60950-1 ■ RF Module: FCC Part 90* Industry Canada RSS137 *Part 90 site license is required for operation in the USA</td></tr><tr><td>Compatibility*</td><td>Protocol*</td><td>Read</td><td>Write</td></tr><tr><td></td><td>TDM (Kapsch) - e.g. E-ZPass®</td><td>•</td><td>•</td></tr><tr><td></td><td>ISO 18000-62 (6B)</td><td>•</td><td></td></tr><tr><td></td><td>ISO 18000-63 (6C)</td><td>•</td><td>•</td></tr><tr><td></td><td>ATA ISO 10374</td><td>•</td><td></td></tr><tr><td></td><td>SeGo</td><td>•</td><td></td></tr><tr><td></td><td>Allegro</td><td>•</td><td></td></tr><tr><td>Communications Interface</td><td colspan="3">■ Ethernet (10/100/1000Base-T)/RS232/RS422</td></tr><tr><td>RF Channel Capacity*</td><td colspan="3">■ Supports up to eight lane-based or five AET channels, with the option to connect and sync multiple readers to support additional lanes.*</td></tr></table> <p><i>*Janus MPR2 supports a number of different protocol installations and features based upon customer requirements; contact your account executive for more information.</i></p> <p>Active RFID transponders</p> <p>Backscatter RFID transponders</p> <p>Backscatter RFID transponders</p> | Technical Specifications | | | | Operating Frequency | ■ 902 to 921.5 MHz | | | Dimensions (W x H x D) | ■ 19.0 in (48.3 cm) rack mount (10U height) ■ 19.0 x 17.5 x 11.0 in. / 48.3 x 44.5 x 27.9 cm | | | Weight | ■ 63 lbs. / 28.6 kg (cabinet options available) | | | Buffered Capacity * | ■ 400,000 to 1,000,000 transactions | | | Error Checking | ■ Protocol specific | | | Operating Temperature | ■ -34.6°F to +131°F / -37°C to +55°C ■ -34.6°F to +165°F / -37°C to +74°C (with circulating fans) | | | Storage Temperature | ■ -49°F to +199°F / -45°C to +93°C | | | Shock & Vibration | ■ NEMA TS-1 | | | Relative Humidity | ■ 5 % to 95 % non-condensing | | | Input Power/Consumption | ■ 350W (redundant), 296W (non-redundant) @ 120 VAC | | | Regulatory | ■ Reader: FCC Part 15 Class A UL 60950-1 ■ RF Module: FCC Part 90* Industry Canada RSS137 *Part 90 site license is required for operation in the USA | | | Compatibility* | Protocol* | Read | Write | | TDM (Kapsch) - e.g. E-ZPass® | • | • | | ISO 18000-62 (6B) | • | | | ISO 18000-63 (6C) | • | • | | ATA ISO 10374 | • | | | SeGo | • | | | Allegro | • | | Communications Interface | ■ Ethernet (10/100/1000Base-T)/RS232/RS422 | | | RF Channel Capacity* | ■ Supports up to eight lane-based or five AET channels, with the option to connect and sync multiple readers to support additional lanes.* | | |
| Technical Specifications | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Frequency | ■ 902 to 921.5 MHz | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dimensions (W x H x D) | ■ 19.0 in (48.3 cm) rack mount (10U height) ■ 19.0 x 17.5 x 11.0 in. / 48.3 x 44.5 x 27.9 cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Weight | ■ 63 lbs. / 28.6 kg (cabinet options available) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Buffered Capacity * | ■ 400,000 to 1,000,000 transactions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Error Checking | ■ Protocol specific | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Temperature | ■ -34.6°F to +131°F / -37°C to +55°C ■ -34.6°F to +165°F / -37°C to +74°C (with circulating fans) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Storage Temperature | ■ -49°F to +199°F / -45°C to +93°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shock & Vibration | ■ NEMA TS-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relative Humidity | ■ 5 % to 95 % non-condensing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Input Power/Consumption | ■ 350W (redundant), 296W (non-redundant) @ 120 VAC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Regulatory | ■ Reader: FCC Part 15 Class A UL 60950-1 ■ RF Module: FCC Part 90* Industry Canada RSS137 *Part 90 site license is required for operation in the USA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compatibility* | Protocol* | Read | Write | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TDM (Kapsch) - e.g. E-ZPass® | • | • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ISO 18000-62 (6B) | • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ISO 18000-63 (6C) | • | • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ATA ISO 10374 | • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SeGo | • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Allegro | • | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Communications Interface | ■ Ethernet (10/100/1000Base-T)/RS232/RS422 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RF Channel Capacity* | ■ Supports up to eight lane-based or five AET channels, with the option to connect and sync multiple readers to support additional lanes.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | JANUS Multiprotocol Reader II at 2. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Kapsch offers both active (TDM) and passive (6C) RFID transponders. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| U.S. Patent No. 9,262,656 | |
|---------------------------|---|
| Claim | Kapsch MPR2 |
| | <p>Kapsch TrafficCom offers passive, battery-free UHF RFID transponders suitable for large-scale and price-sensitive ITS applications in conjunction with complete RFID-based solutions. The UHF RFID transponders are sourced from leading vendors after passing a qualifying examination with particular regard to their capability for ITS applications. The passive UHF RFID transponders are intended to be used in combination with readers from Kapsch that support the EPC™ Class1 Gen2/ISO 18000-63 air interface protocol standard.</p> <p>UHF RFID passive transponders (https://www.kapsch.net/ktc/Portfolio/Products/In-Vehicle-Products/UHF-RFID-Passive-Transponders).</p> |

| | U.S. Patent No. 9,262,656 |
|-------|---|
| Claim | Kapsch MPR2 |
| | <p data-bbox="533 277 762 305"><u>Kapsch TrafficCom</u></p> <p data-bbox="533 347 842 402">TRP-8610.</p> <p data-bbox="533 423 1276 472"><i>UHF RFID Passive Windshield Tag.</i></p> <p data-bbox="533 516 1892 581">With its high performance and high security features, the Windshield Tag delivers superior read performance. It is designed and tuned specifically for optimal performance when used on glass windshield of vehicles.</p> <div data-bbox="533 630 972 873"> <p>The Windshield Tag is designed for use on vehicle windscreens. The Windshield Tag is constructed to provide reliable reading for years, even in extreme weather and driving environments. Designed as a vehicle tag, only outdoor and automotive application-grade materials are used in its manufacture.</p> </div> <div data-bbox="533 911 972 1276"> <p>The Windshield Tag is intended for use in high performance and security applications such as Electronic Toll Collection (ETC), Electronic Vehicle Registration (EVR), Secure Parking and Access Control, Fleet Management, and other critical vehicle tracking applications. User memory is write-protected, offering a higher level of security. The chip also features a factory pre-programmed and permanently locked 96-bit serial number that cannot be altered.</p> </div> <div data-bbox="533 1312 972 1341"> <p>Kapsch Windshield Tags are available with</p> </div> <div data-bbox="533 1357 1142 1390"> <p>TRP-8610, UHF RFID Passive Windshield Tag.</p> </div> <div data-bbox="993 634 1887 964">  </div> <div data-bbox="1014 1016 1184 1045"> <p>Applications:</p> </div> <div data-bbox="1014 1052 1329 1170"> <ul style="list-style-type: none"> > Electronic Toll Collection > Electronic Vehicle Registration > Parking and Access Control > Vehicle Emissions Inspection > Fleet Management </div> <div data-bbox="982 1218 1434 1341"> <p>features such as Non-Removeable Non-Transferable (NRNT) and Tamper Evident Feature, IR and UV Light Protection Filter, Customer Press or Variable Printing,</p> </div> <div data-bbox="1470 1016 1602 1045"> <p>Features:</p> </div> <div data-bbox="1455 1052 1854 1146"> <ul style="list-style-type: none"> > Specially designed for windshield glass > ISO 18000-63 (6C) / EPC C1G2 > Great Read Performance > UHF band 860-960MHz </div> <div data-bbox="1440 1218 1896 1305"> <p>and Custom Chip Programming. Optional custom packaging and tag sizes are also available.</p> </div> |

| U.S. Patent No. 9,262,656 | |
|---------------------------|---|
| Claim | Kapsch MPR2 |
| | <div><h1>Kapsch TDM / TDMA transponders.</h1><p>Kapsch TrafficCom is a leading and experienced global provider of high-performance intelligent transportation systems. With its end-to-end portfolio, Kapsch offers solutions across its customer's entire value chain — from single products and components, to fully integrated turnkey systems and solutions in the applications of electronic toll collection, commercial vehicle operations and highway traffic management. Kapsch 915 MHz products and components offer an open, modular and flexible design, allowing our customers to meet individual market demand.</p><p>Kapsch 915 MHz Transponder Product Line brochure at 2.</p><div><div><p>Interior (TDM) Removable or Permanent</p><p>Dimensions: 3.7 x 1.9 x 0.9 in 94.0 x 48.3 x 23.0 mm</p></div><div><p>Interior (TDM) Driver Feedback Removable</p><p>Dimensions: 3.7 x 1.9 x 0.9 in 94.0 x 48.3 x 23 mm</p></div><div><p>Interior (TDMA), with Feedback Removable</p><p>Dimensions: 3.6 x 2.8 x 1.0 in 90.6 x 70.9 x 25.7 mm</p></div></div><p>Kapsch 915 MHz Transponder Product Line brochure at 3.</p></div> |



| | U.S. Patent No. 9,262,656 |
|-------|---|
| Claim | Kapsch MPR2 |
| | <p>Upon information and belief, Kapsch transponders compatible with the IAG protocol also use at least two commands. For example, Kapsch transponders use a pulse command from the MPR2 reader to trigger a response with transponder data. Kapsch transponders also use proprietary commands including for example commands for programming. For example, the IAG frame includes a 7-bit beacon that can be used to provide multiple commands. The IAG frame also includes a Program Data portion that can be used to command the transponder to be programmed.</p> <p>For each RF event depicted in Figure 1-2 the sequence is nominally as shown in Figure 1-3. The reader activates the transponder for the event by transmitting a trigger pulse of carrier. When the transponder detects a trigger pulse it responds by sending the data from its internal memory back to the reader. This constitutes a Read cycle.</p> <p style="text-align: center;">Figure 1-3: RF Event Time Sequence</p>  <p>Kapsch Active TDM Over-Air Specification for electronic Toll Communications at 8.</p> <p>“If program data is detected as having been sent by the reader and this data is validated as defined herein, the transponder will store the received data in its internal memory, overwriting prior data, such that on subsequent triggers the transponder will transmit the new data.” Kapsch Active TDM Over-Air Specification for electronic Toll Communications at 8.</p> |

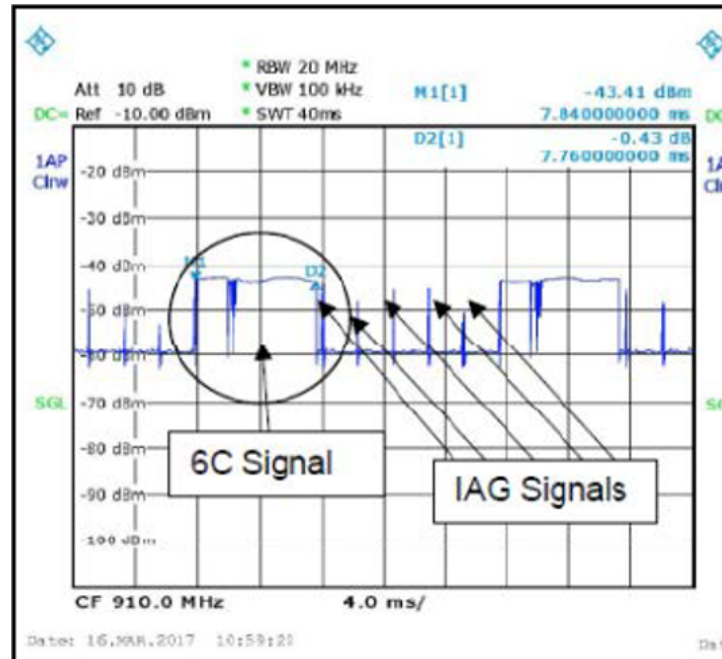
| U.S. Patent No. 9,262,656 | | | | | | | | | | | | | | | | | | | |
|---|---|------------|---------|---|-------|-------|---|--------|---|---|--|----|--|---------|--|--|-----|--|--------|
| Claim | Kapsch MPR2 | | | | | | | | | | | | | | | | | | |
| | <div><div>3.1 Beacon</div><div>The Beacon shall be organized as a 7-bit word in accordance with Figure 3-1. The fields comprising the word shall be set according to the following.</div><div><div>Figure 3-1: Beacon</div><div><table><tr><td>Bit Number</td><td>6</td><td>5</td><td>.....</td><td>3</td><td>2</td><td>.....</td><td>1</td><td>0</td></tr><tr><td></td><td colspan="2">HO</td><td colspan="3">Channel</td><td colspan="2">RFU</td><td>Parity</td></tr></table></div><div>Data is shown from most-significant bit on left to least significant bit on right</div><div>The HO bit shall indicate whether or not the RF capture zone for the reader antenna transmitting the Beacon is associated with a lane in which transponders of Tag Type HOV/HOT (see Section 3.2.1) to which application specific HOV/HOT rules apply. If the HO bit is set to 1, then the transponder shall interpret the RF capture zone as being one in which such rules apply. Note that the application specific rules are defined external to this protocol specification.</div><div>Kapsch Active TDM Over-Air Specification for Electronic Toll Communications at 20.</div></div></div> | Bit Number | 6 | 5 | | 3 | 2 | | 1 | 0 | | HO | | Channel | | | RFU | | Parity |
| Bit Number | 6 | 5 | | 3 | 2 | | 1 | 0 | | | | | | | | | | | |
| | HO | | Channel | | | RFU | | Parity | | | | | | | | | | | |
| 29[b] an interrogator system for communicating with said transponders using at least two different protocols in at least two different capture zones, | <div><div>The MPR2 comprises an interrogator system for communicating with transponders using at least two different protocols in at least two different capture zones.</div><div>The MPR2 is capable of communicating with transponders using at least two different protocols. For example, the MPR2 operating manual states that an antenna installation can use “TDM protocol, <u>and</u>/or ISO18000-6C protocol”.</div><div>8. For TDM protocol, and/or ISO18000-6C protocol (read only) only, the antenna installation may be all antennas IAG 3 only) inline across the roadway as shown in Figure 5-3.</div><div>Kapsch JANUS Multi-Protocol Reader Ver. 2 Operator and Maintenance Manual at 169.</div></div> | | | | | | | | | | | | | | | | | | |

U.S. Patent No. 9,262,656

Claim

Kapsch MPR2

Testing further shows that the MPR2 is capable of communicating with transponders using 6C and IAG protocols. For example, the plot below shows that an MPR2 alternates between communicating with 6C and IAG protocols.



The plot below further shows that each RF module in an MPR2 is capable of communicating using both protocols.

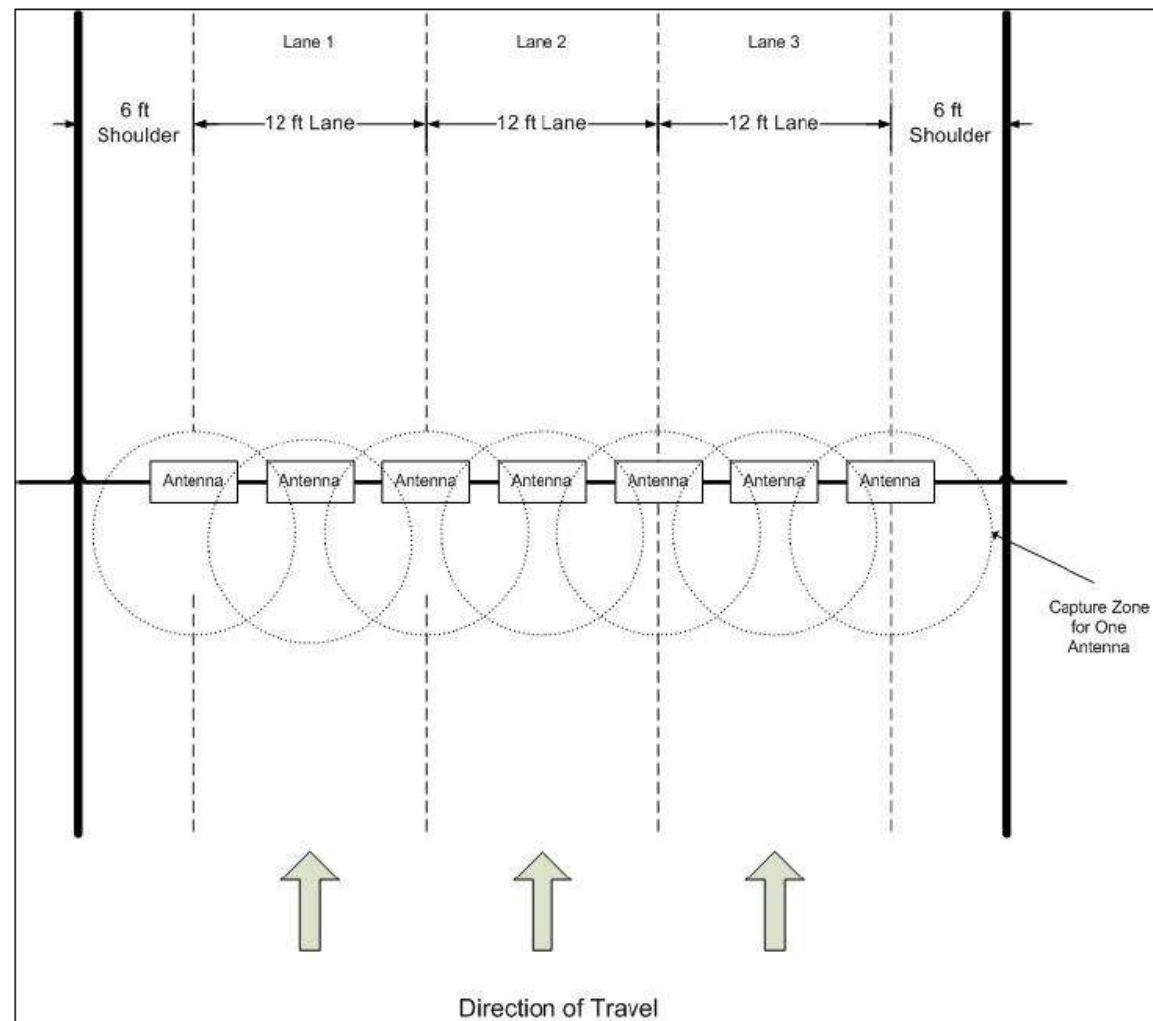
| | U.S. Patent No. 9,262,656 |
|-------|--|
| Claim | Kapsch MPR2 |
| | <div data-bbox="688 266 1801 656"> </div> <p data-bbox="527 695 1871 764">An MPR2 is capable of covering at least two different capture zones. For example, the MPR2 datasheet describes the system as supporting eight “lane-based” RF channels. JANUS Multiprotocol Reader II at 2.</p> <p data-bbox="527 803 1392 837">Each lane can constitute a capture zone for a respective RF module.</p> <p data-bbox="527 876 1906 946">The JANUS MPR Operating Manual indicates that a lane kit includes an MRFM-S and an antenna, and that there is one MRFM-S for each antenna.</p> <p data-bbox="655 963 1157 997">JANUS MPR system components</p> <p data-bbox="655 1019 1829 1053">Figure 2-1: A Redundant Reader shows a rack equipped with eight Smart MRF modules (MRFM-S).</p> <p data-bbox="655 1066 919 1101">A Lane Kit consists of:</p> <ul data-bbox="856 1114 1528 1279" style="list-style-type: none"> • An antenna (see Figure 2-2) • An MRFM-S(② in Figure 2-1: A Redundant Reader) • Two feedline adapter cables • One Circulator <p data-bbox="527 1330 1646 1364">Kapsch JANUS Multi-Protocol Reader Ver. 2 Operator and Maintenance Manual at 27.</p> |

| U.S. Patent No. 9,262,656 | | | |
|---------------------------|---|----------------------------|--|
| Claim | Kapsch MPR2 | | |
| | | Units per Redundant Reader | One MRFM-S for each antenna. A maximum of 8 MRFM-S per Reader. |
| | <p>Kapsch JANUS Multi-Protocol Reader Ver. 2 Operator and Maintenance Manual at 32.</p> <p>Each MRFM-S and antenna pair create a RF coverage zone on the roadway. The antennas are situated to create overlapping coverage zones between channels. For high speed lanes, one reader can support 5 channels. When required, multiple readers can be synced together to support additional channels.</p> <p>Kapsch JANUS Multi-Protocol Reader Ver. 2 Operator and Maintenance Manual at 153.</p> <p>An example inline installation is illustrated below. In this figure, a capture zone is shown for each antenna. As discussed above, there is one antenna per MRFM-S (“MRFM-S and antenna pair”) such that the antenna’s capture zone is also the capture zone for the corresponding MRFM-S.</p> | | |

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Figure 5-4: Inline Antenna Installation




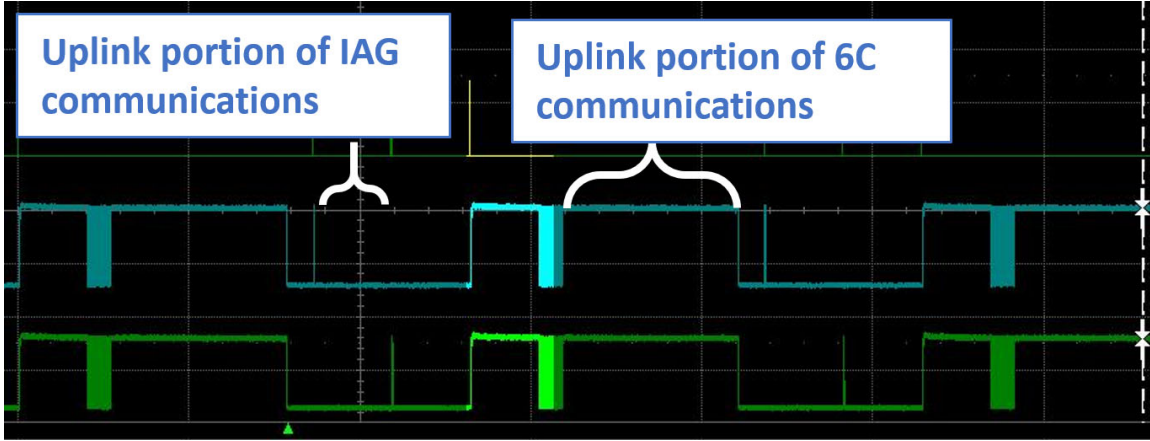
Kapsch JANUS Multi-Protocol Reader Ver. 2 Operator and Maintenance Manual at 170.

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| 1[c] at least one of said protocols having multiple commands, such that at least two commands are used in communicating with a transponder and at least part of the commands sent to the transponders are sent at the same time, and | <p>The MPR2 is capable of communicating with transponders using a protocol having multiple commands, such that at least two commands are used in communicating with the transponder.</p> <p>As discussed above for limitation 1[b], the MPR2 is capable of communicating with transponders that use the 6C protocol. The 6C protocol has multiple commands. For example,</p> <p style="text-align: center;">2.3 Command structure and extensibility</p> <p style="text-align: center;">This part of ISO/IEC 18000 allows four command types: (1) mandatory, (2) optional, (3) proprietary, and (4) custom. Subclause 6.3.2.12 and Table 6.28 define the structure of the command codes used by Interrogators and Tags for each of the four types, as well as the availability of future extensions. All commands defined by this protocol are either mandatory or optional. Proprietary or custom commands are manufacturer-defined.</p> <p>International Standard ISO/IEC 18000-63 at 3 (10-15-2015).</p> <p>The 6C protocol uses a sequence of multiple commands to communicate with a tag, as shown in the partially-reproduced state diagram below.</p> |

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| Claim | |
|-------|--|
| | <pre> graph TD Start([Power-up & ~killed]) --> Ready((Ready)) Ready -- "Cmd: Select, Challenge Action: Return to ready Reply: None. Note 1" --> Ready Ready -- "Cmd: Query Action: New round Reply: Note 4" --> Ready Ready -- "Cmd: All other Action: Remain in ready Reply: None" --> Ready Ready --> Arbitrate((Arbitrate)) Arbitrate -- "Cmd: QueryRep, QueryAdjust [slot <= 0] Reply: None. Note 3" --> Arbitrate Arbitrate -- "Cmd: QueryAdjust, QueryRep [slot=0] Reply: New RN16. Note 3" --> Reply((Reply)) Reply -- "Cmd: QueryAdjust [slot = 0] Reply: New RN16. Note 3" --> Reply Reply -- "Cmd: ACK [correct RN16] Reply: See Table 6.17" --> Acknowledged((Acknowledged)) Reply -- "Cmd: Req_RN [incorrect RN16] Reply: None" --> Acknowledged Acknowledged -- "Cmd: ACK [correct RN16] Reply: See Table 6.17" --> Acknowledged Acknowledged -- "Cmd: Req_RN [correct RN16] & {access password <= 0} Reply: handle" --> Acknowledged Acknowledged -- "Cmd: Req_RN, Read, Write, Lock, BlockWrite/Erase/Permalock, ReadBuffer, Untraceable, KeyUpdate, TagPrivilege, FileSetup/Open/Privilege/List, security timeout. Reply: See state-transition tables" --> Acknowledged Acknowledged -- "Cmd: ACK [correct handle] Reply: See Table 6.17" --> Acknowledged Acknowledged -- "Cmd: Kill [kill disallowed]. Note 6." --> Acknowledged Acknowledged --> End([]) </pre> <p>International Standard ISO/IEC 18000-63 at 59 (10-15-2015).</p> <p>In addition, the MPR2 is capable of communicating with transponders using a protocol having multiple commands, where at least part of the multiple commands are sent by the MPR2 at the same time, as shown in the plot below.</p> |

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|---|---|------------|-----------|------------|-----------|-------|-------|----|------|---------|-----------|---------|-----------|----|------|------------|-----------|------------|-----------|----|------|------------|----------|------------|---------|----|------|-----------|-----|---|---|----|------|-----------|-----|---|---|----|------|-----------|-----|---|---|----|------|------|-----|---|---|----|------|------|-----|---|---|----|------|------|-----|---|---|
| Claim | Kapsch MPR2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |  <p>The screenshot shows a multi-channel digital oscilloscope trace. The top section displays several digital signals: RFU2 (yellow), C3 (cyan), C4 (green), and two RF channels (Rf Channel 0 in cyan and Rf Channel 1 in green). A white circle highlights a specific time point where multiple signals are active. A text box with the text "Part of 6C commands sent at same time" points to this circle. The bottom section shows a detailed view of the signals, with a table of measurements for each channel.</p> <table data-bbox="560 997 1205 1110"><tr><th>Channel</th><th>Signal</th><th>Level</th><th>Rate</th><th>Width</th><th>Delay</th></tr><tr><td>C3</td><td>DC50</td><td>11.8 mV</td><td>20.0 MS/s</td><td>11.0 mV</td><td>20.0 MS/s</td></tr><tr><td>C4</td><td>DC50</td><td>-16.800 mV</td><td>20.0 MS/s</td><td>9.4 mV/div</td><td>20.0 MS/s</td></tr><tr><td>C4</td><td>DC50</td><td>-37.200 mV</td><td>1.000 MS</td><td>255 µs/div</td><td>51.0 kS</td></tr><tr><td>C4</td><td>DC50</td><td>12.971 mV</td><td>0x0</td><td>—</td><td>—</td></tr><tr><td>C4</td><td>DC50</td><td>17.170 mV</td><td>0x0</td><td>—</td><td>—</td></tr><tr><td>C4</td><td>DC50</td><td>12.971 mV</td><td>0x0</td><td>—</td><td>—</td></tr><tr><td>C4</td><td>DC50</td><td>0 µV</td><td>0x0</td><td>—</td><td>—</td></tr><tr><td>C4</td><td>DC50</td><td>0 µV</td><td>0x0</td><td>—</td><td>—</td></tr><tr><td>C4</td><td>DC50</td><td>0 µV</td><td>0x0</td><td>—</td><td>—</td></tr></table> <p>TELEDYNE LECROY</p> <p>10/29/2020 11:41:55 AM</p> | Channel | Signal | Level | Rate | Width | Delay | C3 | DC50 | 11.8 mV | 20.0 MS/s | 11.0 mV | 20.0 MS/s | C4 | DC50 | -16.800 mV | 20.0 MS/s | 9.4 mV/div | 20.0 MS/s | C4 | DC50 | -37.200 mV | 1.000 MS | 255 µs/div | 51.0 kS | C4 | DC50 | 12.971 mV | 0x0 | — | — | C4 | DC50 | 17.170 mV | 0x0 | — | — | C4 | DC50 | 12.971 mV | 0x0 | — | — | C4 | DC50 | 0 µV | 0x0 | — | — | C4 | DC50 | 0 µV | 0x0 | — | — | C4 | DC50 | 0 µV | 0x0 | — | — |
| Channel | Signal | Level | Rate | Width | Delay | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C3 | DC50 | 11.8 mV | 20.0 MS/s | 11.0 mV | 20.0 MS/s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | DC50 | -16.800 mV | 20.0 MS/s | 9.4 mV/div | 20.0 MS/s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | DC50 | -37.200 mV | 1.000 MS | 255 µs/div | 51.0 kS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | DC50 | 12.971 mV | 0x0 | — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | DC50 | 17.170 mV | 0x0 | — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | DC50 | 12.971 mV | 0x0 | — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | DC50 | 0 µV | 0x0 | — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | DC50 | 0 µV | 0x0 | — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C4 | DC50 | 0 µV | 0x0 | — | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29[d] wherein at least a portion of an uplink portion of communications with said first transponder and a portion of an uplink portion of communications with | <p>The MPR2 is capable of communicating with transponders using a protocol having multiple commands, wherein at least a portion of an uplink portion of communications with a first transponder and a portion of an uplink portion of communications with a second transponder do not overlap in time.</p> <p>As discussed above for limitation 1[c], the MPR2 includes an IAG/TDM pulse at the first sequence portion. In response to this IAG/TDM pulse, an IAG/TDM/E-ZPass tag, which is an active RFID transponder, provides an uplink signal that is read by the MPR2.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Claim | U.S. Patent No. 9,262,656 Kapsch MPR2 |
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| said second transponder do not overlap in time. | <p>How the JANUS MPR2 Electronic Toll Collection (ETC) Subsystem works</p> <p>The MPR2 reader can interact with both active and passive OBUs.</p> <p>Active OBU</p> <p>For an active OBU, overhead antennas send out RF signals. As a vehicle equipped with an active OBU approaches a toll zone, the OBU receives an RF signal from the antenna. The OBU then starts transmitting data, which is received by the antenna and passed on to the Reader via an MRFM-S module. The Reader processes and logs the OBU data, and then sends the information to the Lane Controllers (LCs). The Reader can also send data back to the OBU, such as an updated toll account balance.</p> <p>Kapsch JANUS Multi-Protocol Reader Ver. 2 Operator and Maintenance Manual at 27.</p> <p>As shown in the example below, an uplink portion of communications with a 6C transponder do not overlap in time with an uplink portion of communications with an IAG transponder.</p>  <p>The diagram illustrates the timing of uplink communications for two different transponder types: IAG (Inter-Agency Access) and 6C (6C). The IAG uplink is represented by a green signal, and the 6C uplink is represented by a cyan signal. Both signals are shown as pulses on a timeline. The IAG uplink pulse occurs first, followed by a gap, and then the 6C uplink pulse occurs. This visualizes that the uplink portions of communications for these two transponder types do not overlap in time.</p> |